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PD-200300A (BOE 0463 PA)

IN THE CLAIMS:

1. A semiconductor device comprising: (previously presented) a germanium substrate having a first type of doping;

a nucleation layer of group III-V materials disposed upon said germanium substrate, wherein the deposition of said nucleation layer also forms a germanium junction forming layer on a portion of said germanium substrate, said germanium junction forming layer being actively doped with a constituent element of said nucleation layer, said actively doped germanium junction forming layer having an opposite doping to said first type of doping;

at least one layer of a group III-V semiconductor material adjacent to and disposed upon said nucleation layer;

a first electrical contact formed on said germanium substrate; and

a second electrical contact formed on one of said at least one layer of a group III-V semiconductor material;

a third electrical contact formed on said one or another of said at least one layer, said third electrical contact electrically coupled to said second electrical contact to form a device, said device selected from the group consisting of a transistor, a resistor and a diode; and

a fourth electrical contact formed on said one or another of said at least one layer of said group III-V semiconductor material, said fourth electrical contact electrically coupled to said second electrical contact to form a second device, said second device selected from the group consisting of a transistor, a resistor and a diode.

- 2. (original) The semiconductor device of claim 1, wherein said constituent element is selected from the group consisting of Phosphorus, Arsenic, and a combination of Phosphorus and Arsenic.
- 3. (previously presented) The semiconductor device of claim 2. wherein said germanium junction forming layer also being actively doped with a second constituent element from said at least one layer of said group III-V semiconductor material.

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- 4. The semiconductor device of claim 1, wherein said (original) second constituent element is selected from the group consisting of Phosphorus, Arsenic, and a combination of Phosphorus and Arsenic.
 - 5. (cancelled)
- 6. The semiconductor device of claim 1, wherein the level of (original) said first dopant is a function of a desired frequency operating range and photo-response characteristics of the semiconductor device.
- 7. (original) The semiconductor device of claim 1, wherein said nucleation layer is lattice-matched to said germanium substrate.
- 8. (original) The semiconductor device of claim 7, wherein said nucleation layer is an InGaP layer.
 - 9. (cancelled)
 - (cancelled) 10.
 - 11. (cancelled)
 - 12. (cancelled)
 - 13. (cancelled)
 - 14. (cancelled)
 - 15. (cancelled)

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16.	(cancelled)
17.	(cancelled)
18.	(cancelled)
19.	(cancelled)
20.	(cancelled)
21.	(cancelled)
22.	(cancelled)
23.	(cancelled)
24.	(cancelled)
25.	(cancelled)
26.	(cancelled)

- (original) The semiconductor device of claim 1, further comprising 27. coupling said first electrical contact with said second electrical contact to form an optoelectronic integrated circuit.
 - 28. (cancelled)